

Dr. Adrija Roy

Position: Postdoctoral Researcher
Working Group "Resource-Efficient Cropping Systems"



Academic education and scientific degrees

07/2018 – 01/2023 PhD Water Resources (Civil Engineering)
08/2016 – 07/2018 M.Tech. in RS and GIS (Water Resources Department)
07/2012 – 05/2016 Bachelor of Construction Engineering (B.E.)

Professional experience

09/2023 – 10/2024 Postdoctoral Research Associate, The University of Alabama, Department of Civil Engineering, Center for Complex Hydrosystems Research
11/2022 – 07/2023 Research Officer – Water Resource Management, International Water Management Institute, CGIAR

Research Profile

Background

- Research on resource-efficient cropping systems.
- Skilled in remote sensing, GIS, and hydrological modeling with hands-on experience in tools such as ArcGIS, QGIS, Google Earth Engine, and SNAP.
- Proficient in programming (Python, R, MATLAB) and statistical data analysis, with applications in climate and agricultural research.
- Experienced in the development and implementation of climate-resilient watershed management projects in India.
- Expertise in integrating crop modeling and remote sensing data to enhance agricultural planning and decision-making.
- Published research outputs in peer-reviewed journals and presented findings at international conferences...

Research Activities

- Remote Sensing & GIS Applications: Conducted land use/land cover (LULC) change assessments using remote sensing data (e.g., Sentinel, Landsat) and GIS platforms (ArcGIS, QGIS, Google Earth Engine).
- Crop Management and Irrigation Optimization: Developed and implemented strategies for irrigation optimization using hydrological and crop modeling tools (AQUACROP, CROPWAT) to enhance water use efficiency and improve crop yield.
- Hydrological and Crop Modelling: Applied models like VIC, SWAT, EPIC, and DSSAT to simulate water availability, crop growth, and the impacts of climate variability on agricultural systems.

- Watershed Development & Climate Resilience: Led climate-resilient watershed development projects in Telangana and Odisha, integrating community-based approaches with hydrological modeling to address water scarcity and soil erosion.
- Weather Data Downscaling: Downscaled global climate model (GCM) outputs to regional scales using tools like NetCDF, CDO, and NCL to analyze localized weather patterns and their influence on agricultural systems.
- Water-Energy-Food-Ecosystem Nexus: Conceptualized and implemented WEFE nexus-based solutions for the Ganga Basin, incorporating satellite-derived data and simulation models to balance resource use.
- Data Science & Machine Learning: Utilized advanced machine learning algorithms, including RNN and LSTM, for analyzing time-series climate and vegetation data, enabling better prediction of crop responses to climatic variability.

Functions and memberships

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Websites

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